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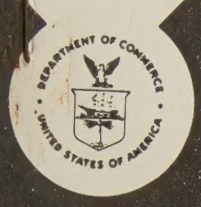

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FISHERIES OF THE IVORY COAST, 1972

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FISHERIES OF THE IVORY COAST, 1972

Norman L. Pease

SUMMARY

The Ivory Coast has enjoyed a steady increase in fish production since industrial fishing began in 1955. The sardine fishery accounts for the major share of production, but sardine seiners are having to fish in increasingly distant waters to maintain their rate of production. Bottomfish production has decreased in recent years because the size of the fleet has declined and catches are less in the waters of neighboring countries. Increasing transshipments of shrimp and tuna through Abidjan have been noted in recent years, reflecting a keen world interest in these products.

The Ivorian fishing fleet badly requires modernization, but the growing instances of extended fisheries jurisdictions have discouraged the fishing industry from making needed investments. An increase in individual consumption is placing great pressure on Ivorian fishermen to either modernize or to increase fishery imports.

INTRODUCTION

The Ivory Coast, formerly a part of French West Africa, has an area slightly larger than New Mexico. It is bounded on the north by Upper Volta and Mali, on the east by Ghana, and on the west by Liberia and Guinea. The southern boundary stretches 550 km along the Gulf of Guinea where a very narrow continental shelf extends outwards from 19 to 29 km. There are about 275 km of lagoons along the southeast coastline of the Ivory Coast.

Abidjan, the capital for that country's 5.5 million inhabitants, is located on the shores of the Ebrie Lagoon. Around the turn of the century Abidjan was an isolated fishing village surrounded by dense tropical jungle. In 1893, a settlement was established by the French and slowly flourished. In 1936, efforts to link Abidjan with the Atlantic Ocean were begun; in 1950, the channel was completed. The channel was instrumental in making the city a busy maritime center and was responsible for the beginning of an industrial fishery.

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FISHERIES

Artisanal:

The artisanal, or canoe, fishermen generally catch about one-fourth of the Ivorian fish. In 1970-71 this amounted to 20,000 t; in 1972 the catch was 24,000 t.

Over 9,000 men are employed in the coastal fishery and use more than 1,000 dugout canoes. There are about 250 large (9-10 m) canoes, typically holding 30 men and some 900 smaller, 2-man canoes. Outboard motors are used on 150 of the larger canoes and on 40 of the smaller canoes. These fishermen use gill nets, hand lines, ring nets (for lobsters), and seines. Most of the coastal fishermen originally came from Ghana and belong to three primary tribes: Fantis, Ketas, and Appolonniens.

In addition, there are about 9,000 fishermen in the lagoon fishery. These fishermen use about 300 large canoes (20 men per canoe) and 1,500 small, 2-man canoes. Cast nets, seines, and traps are commonly used in the lagoon fishery.

The interior has a freshwater fishery that employs an estimated 2,000 men. This fishery, however, is expected to grow considerably in the next 7 years because of the construction of the Kossou Dam.

In November 1972 the Kossou Dam on the White Bandama River was officially inaugurated. When the lake, formed by the dam, reaches its planned maximum level--sometime around 1980--it will cover an area of some 1,750 km^2 and will be 190 km long and 45 km wide. Ivorian experts estimate that about 3,000 fishermen will be able to produce between 8,000 and 10,000 t of fish per year from the lake when it is full.

A US$1 million, 3-year fishery development project is already underway to teach the local people how to harvest fish from the lake. Gill nets (30 by 3m) and wire fish traps baited with cassava are being used. Monofilament webbing is also being introduced. Experiments with various boats have been narrowed down to a model 5.5 by 1.8 m, powered by a 9 hp outboard motor. Figure 1 shows an example of this canoe:

Figure 1.--FAO-designed fishing canoes at Lake Kossou.

A total of 65 species of fish are found in Lake Kossou. The most important species include: Herring (Alestes spp.), tilapia (Tilapia spp.), cyprinids (Distichodus spp.), and carp (Labio spp.). Nile perch are also present and might become important in the future.

Industrial:

Since the inception of the modern fishery in 1955, the Ivorian fisheries catch has increased by over 500 percent. Table 1 illustrates this growth:

Table 1.--Ivory Coast's fisheries catch, 1955-72

Year	Catch
	-------Metric t--------
1972	83,000
1971	75,000
1970	72,000
1969	69,000
1968	65,000
1967	68,000
1966	62,000
1965	63,500
1964	55,000
1963	46,000
1962	40,000
1961	41,000
1960	42,000
1959	37,000
1958	37,000
1957	26,000
1956	19,000
1955	15,000

Despite the rapid growth during the 1960's there have been problems which may begin to affect the Ivorian catch in the 1970's. The most serious problem involves the overfishing of local waters and the increasing travel required to find new stocks of fish. In 1970, for example, only 43 percent of the sardine catch and 40 percent of the bottomfish were actually caught on the Ivorian Continental Shelf. Ivorian fishing vessels are having to work more frequently off the coasts of neighboring countries. To complicate matters the rapid proliferation of increased coastal jurisdictions being claimed in Africa has caused Ivorian businessmen to question whether they will be able to fish off foreign shores in the future. In addition, all the vessels in the fleet of 32 sardine seiners are over 10 yr old and all 25 bottom trawlers are over 15 yr old. These vessels have small carrying capacities and--because of the greater distances the vessels have to travel--their catch sometimes has deteriorated in quality when finally landed.

To overcome these handicaps the Ivorian fishing industry wants to invest in large, distant-water, freezer trawlers. Unless the question of fishery jurisdictions can be settled--and the prospects for this seem dim--such an investment might not prove profitable. Several companies now have informal, annual agreements with Sierra Leone and the Gambia which allows them to fish for sardines. Since Ghana extended its exclusive fishing zone to 30 mi, however, Ivorian vessels have been forced to stop fishing these waters.

1. Sardine fishery:

The sardine fleet contributes over 60 percent of the total Ivorian catch. The predominant species taken are Sardinella eba and S. aurita. The flat sardine (S. eba) prefer low-salinity water and are caught close to shore or in the lagoons during the dry season. The best concentrations are found to the west of Abidjan in 30 m of water. Since 1969 catches of this species have declined apparently because of overfishing. Ivorian authorities have recommended that no more than 20 seiners be allowed to work within 6 mi of the coast, with a maximum annual catch of 10,000 t.

The round sardine (S. aurita) generally prefers high-salinity waters and is found well off shore, generally in depths between 50 and 80 m. Tagging studies have shown that the Ivorian and Ghanaian stocks of this species intermingle, and that nearly 80 percent of the Ivorian catch comes from Ghana. This fishery has two peak production periods: January-March and June-September. Between October and December these sardines move to the bottom in deep water and are unavailable to the seiners. Ivorians believe that production of this species could be increased.

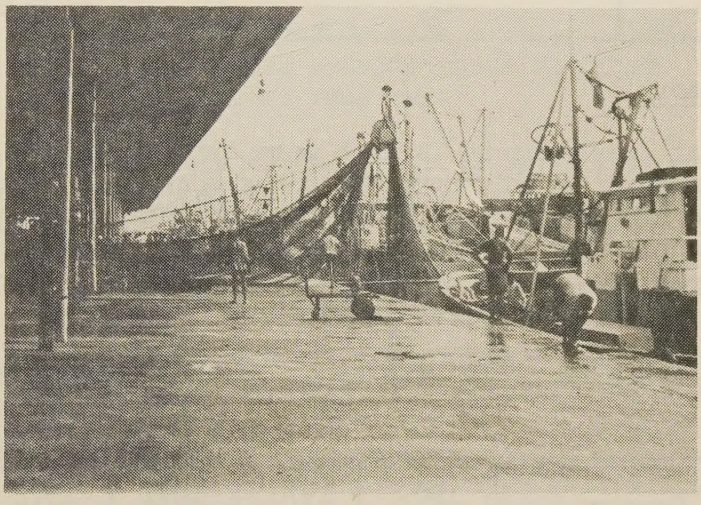

Figure 2.--Transferring a sardine seine to the dock for repairs in Abidjan.

Another species of fish that is available is the mackerel (Scomber japonicus). About 50 t a year could be harvested, but mackerel is not readily acceptable to the Ivorian consumer.

Table 2 shows the catch of the sardine fleet and bottomfish fleets.

Table 2.--Ivory Coast's sardine and bottomfish landings, 1965-72

Year	Catch		Total
	Sardines	Bottomfish	
	---------- Metric t ----------		
1972	41,985	12,936	54,921
1971	39,500	12,012	51,512
1970	36,101	14,359	50,460
1969	29,955	17,760	47,715
1968	26,715	17,295	44,010
1967	31,135	15,460	46,595
1966	24,000	18,000	42,000
1965	28,000	17,000	45,000

2. Bottomfish fishery:

The impact of recent developments is much more evident in the bottomfish fishery than in the sardine industry, which has continued to increase production in spite of difficulties. The Ivorian bottomfish fishing fleet has declined from a high of 40 vessels in 1969 to 25 vessels in 1972. During the course of the past few years the production of this fishery has declined sharply off Ghana and the Gambia (table 3).

Table 3.--Source of Ivorian trawl landings, 1969-72

Country	1969	1970	1971	1972
	-------- Metric t ----------			
Local waters:				
Ivory Coast ...	7,535	6,080	4,937	6,100
Foreign waters:				
Gambia	4,509	4,004	4,189	2,740
Ghana	1,510	1,269	692	274
Sierra Leone ..	4,106	3,006	2,194	3,822
Total	17,760	14,359	12,012	12,936

The steady decline in production is most notable off Ghana and can also be seen in the decreased catches made off the Gambia between 1971 and 1972.

Figure 3.--An Ivorian side trawler. Wide docks provide space for fish trawl repairs.

Croakers (Sciaenidae), grunts (Brachydeuterus sp. & Pomadasys sp.), jacks (Carangidae), seabreams (Pagellus sp., Pagrus sp., & Dentex sp.), and threadfish (Polynemidae) are the predominant species caught by the Ivorian trawler fleet. Table 4 shows the composition of the trawl catch and the average exvessel prices paid for these fish in 1972.

Table 4.--Species and average exvessel prices for fish caught by the Ivorian trawl fleet, 1972

Species	Catch	Price per kilogram
	Metric t	$1.00
Seabreams	2,442	.31
Croakers	2,005	.31
Grunts	1,984	.25
Threadfin	1,304	.28
Jacks	831	.25
Soles & flounders	545	.32
Sharks & rays	510	.22
Silver eels	330	.19
Sea catfish	277	.22
Ten pounder & bonefish	262	.35
John Dory	220	.27
Razor belly	97	.24

3. Tuna fishery:

The Ivorian tuna fishery, which began in 1970, has enjoyed a steady increase in production and should continue to develop in the next decade. Table 6 shows the catch statistics for the Ivorian tuna fisheries for this brief period.

Table 5.--Ivorian tuna production, 1970-72

Year	Catch
	Metric t
1972	3,494
1971	2,170
1970	1,000

Two seiners have been supplying tuna to a cannery in Abidjan. One of the vessels is 47 m long and has a 400-t carrying capacity; the other vessel is 38 m long and has a 150-t capacity. A third seiner was launched in France in March 1973; it is 39 m long and has a 190-t capacity (fig. 4). Two more seiners have been ordered from French shipyards and should be delivered in 1974.

Figure 4.--The M/V Trident, the latest addition to the Ivorian tuna fleet.

In early 1973 a new law was decreed that permits licensing of tuna bait boats. The fee is $13.30 per net ton. The license permits the capture of live bait--mainly sardines--within Ivorian waters. Interest has been high in the tuna industry, and Ivorians expect that many licenses will be issued in the next few years.

In addition, Abidjan has become a center for the holding and transshipping of tuna to the United States and Europe (fig. 5). Table 6 indicates the number of foreign flag tuna vessels that unloaded tuna for transshipment in Abidjan during the past few years.

Table 6.--Foreign tuna vessels transshipping through Abidjan, 1970-72

Vessel nationality	1970	1971	1972
	----Number of vessels ----		
France	58	49	36
South Korea.....	25	30	44
Spain	21	11	10
Taiwan	20	36	48
Senegal	12	10	13
United States.....	8	7	28
Japan	3	24	20
Panama	-	18	20
Morocco	-	-	1
Total	147	185	220

On March 2, 1970, a law was passed that required that all yellowfin tuna, landed or transshipped through Abidjan, should weigh more than 3 kg and that all skipjack tuna should weigh more than 2 kg.

Figure 5.--Unloading frozen yellowfin tuna in Abidjan from a South Korean tuna longliner.

4. Shrimp fishery:

Juvenile shrimp (Penaeus duorarum notialis) have been taken for many years by Ghanaian fishermen at Assini from the lagoon that borders Ghana and the Ivory Coast. Statistics for this production have not been kept. but the government estimates not more than 100 t per year. In 1967, two companies started small exploratory efforts to organize and expand the lagoon shrimp fishery. One of the companies began trawling offshore stocks of shrimp. This small fleet is still operating. Practically all of the production is frozen for export. Table 7 provides statistical data on the Ivory Coast's shrimp production.

Table 7.--Ivorian offshore and lagoon shrimp production, 1967-72

Year	Offshore	Lagoon	Total
	Metric t		
1972	467	405	872
1971	705	621	1,326
1970	624	304	928
1969	487	287	774
1968	-	385	385
1967	-	315	315

Local authorities believe that the Ivory Coast could produce between 1,000 and 1,300 t of shrimp per year. In 1971, the maximum figure was reached, but production in 1972 was less than the estimated yield. This decline was due, in part, to the fact that 13 shrimp vessels left Ivorian waters--some vessels for as long as 6 mo--to fish elsewhere in West Africa. However, they returned their catch of 440 t to Abidjan for transshipment.

Figure 6 shows a double-rigged, shrimp trawler/freezer that is capable of staying at sea for periods of up to 30 days. The catch is graded and packed at sea and is delivered in master cartons ready for shipment.

Figure 6.--An Ivorian double-rigged shrimp trawler/freezer vessel.

In the lagoon fishery juvenile shrimp are caught in nets stretched between two stakes in the middle of the channel. On an outgoing tide the shrimp are swept into these nets. This fishery is centered in four locations: Assini, the Ebrie lagoon at Grand Bassam and Dabou, and at Grand Lahou. However, in 1972 the channel at Grand Bassam was filled by sand and the processing plant there was closed. In early 1973 the channel at Grand Lahou started filling with sand and was closed entirely by late April of that year. This latter closure will undoubtedly reduce the 1973 shrimp catch. Part of the reason for the closures is the extended drought in Mali and Upper Volta. As the watersheds in those countries dry, the volume of water flowing south is considerably reduced. When the drought eases the channels should reopen and normal shrimping should be resumed.

FISH CONSUMPTION AND IMPORTS

To emphasize the importance of fish to the Ivorian diet the Fisheries Service has compiled the following table showing past, present, and future consumption of fish in the Ivory Coast.

Table 8.--Ivorian fish consumption, 1960-80

Year	Population	Per capita consumption	Consumption by weight
	Number	Kg	Metric t
1980 ...	6,700,000	25	170,000
1975 ...	5,800,000	23	130,000
1970 ...	5,000,000	20	100,000
1965 ...	4,300,000	18	78,500
1960 ...	3,300,000	17	64,000

In 1972 the people of the Ivory Coast consumed 118,610 t of fish for an average per capita consumption of 21.6 kg per person. These fishery supplies came from the following sources:

Industrial fishing.....	54,950 t
Artisanal fishing	24,000 t
Frozen imports	23,760 t
Smoked fish imports	13,500 t
Canned imports	2,400 t
Total	118,610 t

Because of this increased demand for fish the Ivory Coast has been importing increased amounts of fish--especially frozen products--from foreign flag vessels and countries since 1969. Most of the Ivory Coast's frozen fish imports, for example, come from Senegal, the Soviet Union, Poland, Rumania, and Japan. These frozen products are taken directly from foreign flag vessels visiting Abidjan or in the process of transshipping catches. Unless the Ivory Coast can increase its domestic production of fishery products in the future, there will be a growing demand for fishery imports.

PORT FACILITIES

Abidjan at the present time has 2 piers for fishing vessels; one is 602 m long and the other is 255 m long. Another pier, 270 m long is being built, and materials to build a fourth pier of 225 m are being purchased. There is an open-side sales shed 350 by 22 m built on the 602-m pier. (A portion of the open air fish auction shed is visible on the left side of fig. 2.)

A new commercial port was recently completed in San Pedro, a city about 300 km west of Abidjan. An economic study is being made on the advisability of constructing a 150-m pier for large trawlers and a 100-m pier for small coastal fishing boats.

Ivorian shipyards are all located in Abidjan. CARENA (Compagnie Abidjanaise de Reparations Navales et de Travaux Industriels) has the largest capacity with two floating drydocks, one 2,200 t and the other 600 t. In addition they have 5 slipways of 80, 100, 200, 240, and 300 t. SFEDTP (Societe Francaise d'Entreprise de Dragage et de Travaux Publics) has 2 slips of 100 and 1,000 t. A third shipyard is being planned by a private Ivorian group and the Ivorian Armed Forces; they plan to construct a drydock capable of handling vessels up to 2,500 t.

FISH PLANTS AND COLD STORAGE FACILITIES

The growth of the Ivorian fisheries is reflected in the number of new or expanded storage and processing facilities that have been built at the fishing port in the past few years. In addition, cold storage units that are serviced by a fleet of refrigerated trucks are being built throughout the interior of the country. Five companies have now built and service 60 fish depots in the interior of the country. Most of the fish that they handle are imported, frozen blocks.

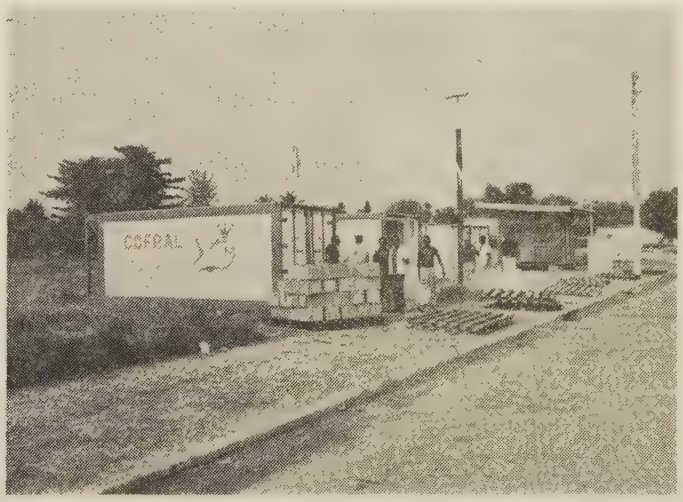

Figure 7.--Small, self-contained freezer units, which are located throughout the interior of the Ivory Coast.

A listing of cold storage and processing plants in the Ivory Coast includes the following firms:

SOGIP (Societe Generale pour l'industrialisation de la peche). This is a cold storage company with a plant capacity of 1,600 t at -20° C. They also produce 60 t of ice per day. The company stores and transships most of the tuna moving through Abidjan.

SOCEF (Societe de construction et d'exploitation de frigorifique) has a cold storage capacity of 3,000 t at -20°C. They are now expanding this capacity to 8,500 t. Ice-making capacity is 150 t per day. There is also storage space for 300 t of fresh fish. The Ivorian Government has provided 45 percent of the capital for this company.

SCODI (Societe de conserveries de Cote d'Ivoire) is an Ivorian-French-owned tuna cannery which has a production capacity of 50 t of tuna per day. This plant, which officially opened in May 1971, processed 3,972 t of tuna in 1972. The production of this plant is exported to France.

FINUMA (Fabrique Ivoirienne de Nuoc-man) is a company which manufactures "nuoc-mam" a Vietnamese fish cause made of fermented fish. In 1972, some 60,000 liters were produced. The Ivorian Government has a 20 percent interest in this company.

FISHERIES RESEARCH

The Ivorian Department of Fisheries is responsible for developing marine and lagoon fisheries, keeping statistics, maintaining quality control--particularly over exports--and suggesting appropriate fisheries legislation. They also coordinate expansion plans for the fishing ports. They are currently centering their attention on improving the techniques and catch rates of the lagoon fishery. They have two research vessels, the R/V President Kennedy, which was recently used in the FAO/UNDP sardinella project, and the R/V Reine Pokou, which is used for shrimp research and general bottom sampling.

There is also a French-supported marine research laboratory, Centre des Recherches Oceanographiques, which has over 100 people on its staff. About half of the staff are French scientists, and the other includes Ivorians. They have a new 47-m research vessel, the R/V Capricorne, which has a speed of 16 kt. The vessel is equipped with over $250,000 of U.S. computer and scientific equipment. Oceanic studies are conducted between the Canary Islands and Cape Town, South Africa. The laboratory currently has 5 major areas of research: tuna, marine shrimp, sardines, lagoon fish, and shrimp and bottom sampling out to 100 m.

The Ivory Coast is a member of the FAO Fishery Committee for the Eastern Central Atlantic and the International Commission for the Conservation of Atlantic Tunas.

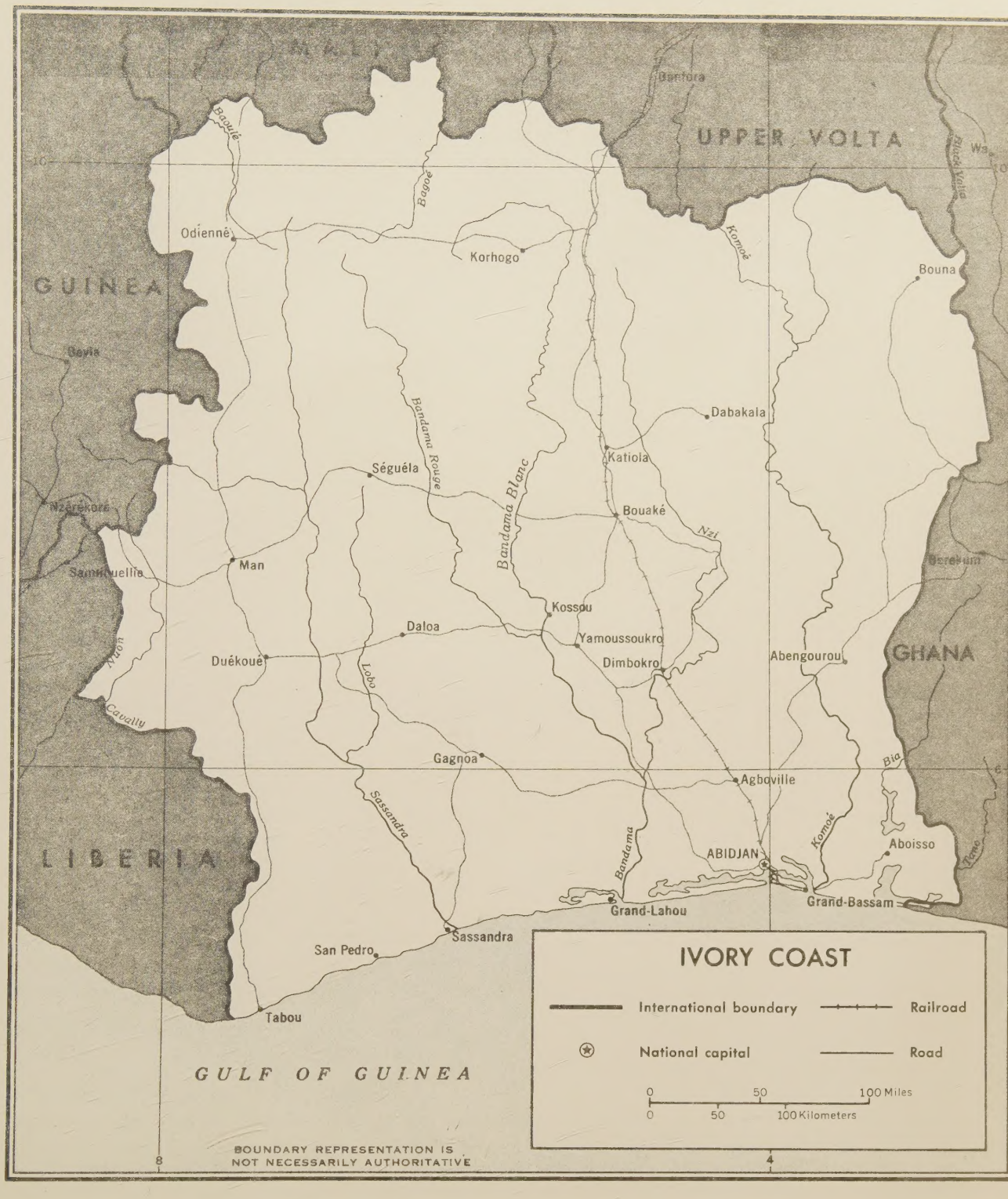

Figure 8.--Map of the Ivory Coast.